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DESCRIPTION

OF A

DEFORMED, FRAGMENTARY HUMAN SKULL,

FOUND IN

AN ANCIENT QUARRY-CAVE AT JERUSALEM;

WITH

AN ATTEMPT TO DETERMINE, BY ITS CONFIGURATION ALONE, THE
ETHNICAL TYPE TO WHICH IT BELONGS.

BY

J. AITKEN MEIGS, M. D. ✓

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"Skulls, madam," said the Sexton.—"Some of them must have belonged to strange fellows. Only see that one! Spirit of Eld, what a skull!"—LAVENGRO.

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DESCRIPTION

OF A

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In September, 1857, Mr. J. Judson Barclay kindly presented to the Academy a fragmentary human cranium discovered by him in an immense quarry-cave at Jerusalem.

The location in which this skull was found, the circumstances attending its discovery, and the very peculiar form which it exhibits, in consequence of the perpendicular flatness of the occiput, render it highly interesting to the cranio-grapher.

From a communication* which appeared in the *Ladies' Christian Annual* for May, 1855, and a letter dated Philadelphia, Aug. 21st, 1857, addressed to the writer by Mr. Barclay,† I gather the following interesting particulars concerning the finding of this skull.

Having received some information of the existence of a very extensive cave near the Damascus gate of Jerusalem, (entirely unknown to Franks,) Mr. Barclay, in conjunction with his father and brother, resolved upon its exploration. Accordingly, having obtained permission to this effect, from the Nazir Effendi, they repaired to the cave, the mouth of which is situated directly below the city wall, and the houses on Bezetha. They found the wall at this spot about ten feet in thickness. Through a narrow, serpentine passage which traverses it they gained an entrance into the cave. The length of the cavern they estimated

* Entitled, "Extract from a Journal kept by R. G. B., during a three years' residence in Jerusalem." See also "The City of the Great King; or, Jerusalem as it was, as it is, and as it is to be." By J. T. Barclay, M. D. Philada. 1858, p. 458.

† See Proceed. Acad. Nat. Sci. for Sept. 1857, p. 177.

at seven hundred and fifty feet, and the circumference upwards of three thousand feet. The roof is supported by numerous regular pillars hewn out of the solid limestone rock. The floor from the entrance to the termination forms an inclined plane, the descent of which is in some places very rapid. About 100 feet from the entrance a very deep and precipitous pit was discovered containing a human skeleton; supposed to be that of some unfortunate who had fallen headlong down and broken his neck, or rather his skull, judging from the fracture which it exhibits. The bones, of almost giant proportions, gave evidence, from their decayed state, of having remained in that position for many years. The skull, unlike the rest of the skeleton, was in a remarkable state of preservation. Numerous crosses on the wall indicate that the devout Pilgrim or Crusader had been there; and a few Arabic and Hebrew inscriptions—too much effaced to be deciphered—prove that the place was not unknown to the Jew and the Arab. The explorers found many intricate, meandering passages leading to immense halls as white as the driven snow, and supported by colossal pillars of irregular shape; some of them placed there by the hand of nature, others of them evidently by the stone quarriers to prevent the intumbling of the city. From their explorations the party concluded that this cavern and the Grotto of Jeremiah, two or three hundred yards distant, originally constituted one immense cave which was formerly the great quarry of Jerusalem.

The cave appears, therefore, to be a very old one. An allusion to it under the name of the "Cotton Grotto" is made by Kadi Mejr-ed-din in an Arabic MS., entitled "The Sublime Companion to the History of Jerusalem and Hebron," and bearing date, A. D. 1495. A gentleman who entered the cave subsequently to the visit of the Messrs. Barclay, tells us, in the "Boston Traveller," that though its existence was long suspected, "nothing was positively known regarding it, as it has been kept carefully closed by the successive governors of Jerusalem. The mouth of the cavern was probably walled up as early as the times of the crusades, to prevent its falling into the hands of a besieging army; earth was thrown up against this wall, so as effectually to conceal it from view, and it is only upon the closest scrutiny that the present entrance can be perceived." Piles of stone chippings, and blocks of stone but half-quarried, and still attached by one side to the rock, were encountered in different parts of the cave. The marks of the cutting instruments were as plain and well-defined as if the workman had but just ceased from his labor. Those who visited the cave were of the opinion that it had been worked as a quarry during the days of Solomon. The following reasons appear to favor this opinion. The stone is the same as that of the portions of the Temple wall still remaining, and referred by Dr. Robinson to the period of the first building. From the former entrance of the cave to the Temple area is a gently inclined plane—a fact that suggests a satisfactory solution of what has heretofore been regarded as a very puzzling question—the difficulty of placing in their present situation, such immense masses of rock as those found at the south-east and south-west corners of the Temple wall. The heaps of chippings which lie about show that the stone was dressed *on the spot*, which accords with the account of the building of the Temple. To these reasons we may also add the extent of the quarry, the amount of stone which must have been worked out there, the size of some of the blocks themselves, the extreme age of the part which has been exposed to the action of the elements, and which dates back in legends and traditions to the time of Jeremiah, the fact that there are no other quarries of any great size near the city, and especially the fact that in the reign of Solomon this quarry, in its whole extent, was *without the limits of the city*.

In the absence of any positive evidence to be derived from the skull itself, these statements are introduced here as being calculated to throw some light upon the question of its antiquity or modernness, and consequently, to a certain extent, its nationality.

1859.]

The cranium found in this cave (No. 1031 of the collection) is probably that of a man aged about 40 or 45 years. In structure it is moderately dense and heavy, and from its general appearance would scarcely be regarded as an ancient skull. It is, unfortunately, in a very fragmentary condition, consisting of the two ossa parietalia, the left temporal, nearly all that part of the os occipitis posterior to the foramen magnum, and enough of the frontal bone to determine the calvarial form. The facial, right temporal and basal bones are altogether wanting. It has evidently been a short, broad and high skull. The coronal region is triangular in shape, with the truncated apex of the triangle directed anteriorly and coinciding with the frontal diameter. The skull belongs therefore to the Triangular Type of the Class Brachyplatopsidæ—the 25th in the new and comprehensive classification of human crania, which I propose to bring before the Academy at some future time. The bi-frontal diameter measures about 4 inches; the bi-parietal, between the ossific centres, $6\frac{1}{2}$ inches; the vertical diameter, from the posterior edge of the foramen magnum to the highest point of the crown directly above, $6\frac{3}{8}$ inches; the intermeatus diameter about $2\frac{1}{2}$ inches. The antero-posterior or longitudinal diameter of the head must have measured about $6\frac{1}{2}$ or $6\frac{3}{4}$ inches. The occipital bone rises vertically from the posterior margin of the great foramen to meet the parietalia which bend abruptly downward between their lateral protuberances. This striking peculiarity gives to the posterior part of the head the same broad, high and perpendicularly flattened appearance, so characteristic of Peruvian Crania. The superior transverse ridge of the occipital bone is well-defined; and the occipital protuberance sharp and prominent. The mastoid process of the temporal bone is large and massive.

Upon the inner surface of the left side, and directly opposite the parietal centre of ossification, there is a solution of continuity in the vitreous table. Both the vitreous and diploic structures at this spot have decayed away or been absorbed, leaving a cavity of an irregularly oval shape, and about five-eighths of an inch long, and half an inch wide. Judging from several minute fissures which radiate in different directions from the edges of this cavity, the latter is the result of a blow, which, without affecting the outer or fibrous, has been strong enough to fracture the inner table. A portion of the surrounding surface of the skull, extending about one inch from the margin of the cavity, is stained of a reddish or iron-rust color.

The muscles attached to the sharp external occipital protuberance, to the well pronounced superior and inferior semi-circular lines or ridges of the os occipitis, and the intervening rough surface, must have been well developed; so that the nape of the neck formed, in all probability, a plane continuous with the back of the head. When with this peculiarity we couple the fact that, owing to the relative position of the external auditory meati, the ears must have appeared to be attached rather to the back part than to the sides of the head, we can readily imagine that the individual to whom the skull belonged must have presented quite a bizarre appearance. The glenoid fossa of the left side remains intact and is especially worthy of notice, since it happens to constitute in this skull the only connecting link or point of attachment between the calvaria and the missing bones of the face. If the Cuvierian law of the correlation or harmonization of forms could be practically applied to the separate pieces composing the human cranium, this fossa would assume a still greater importance, since by means of it the outline of the bony face could be determined, and the observer having, in this indirect way, obtained an exact idea of the shape of the entire head, could proceed more confidently to indicate the precise ethnic type of which this skull is a specimen.

Impracticable, however, as this is, we can approximate the desired information by observing attentively the exact appearance of this fossa. The zygomatic tubercle is well marked; the eminentia articularis, instead of being flatly rounded, as is ordinarily the case, is sharp and well defined, while the anterior

wall of the glenoid cavity is thick and unusually convex. Instead of shelving backwards and upwards from the articular eminence, as is usually the case, particularly, as I am inclined to think, in long heads, it rises abruptly and almost perpendicularly, giving the fossa somewhat the appearance presented by this cavity in the carnivora, and indicating powerful up and down movements of the lower jaw, with diminished lateral action. The lateral motion of the jaw must have been still more restrained by the backward inclination of the internal end of the inferior root of the zygoma. The condyle adapted to such a fossa must have been large and heavy, with a correspondingly short and thick neck. Such characters indicate a heavy, square jaw, with short rami and a flattened or retracted symphysis menti. Corresponding with this, as the head is brachycephalic, the superior maxilla must have been heavy and flat and the malar bones prominent. Reasoning thus we may infer from the glenoid cavity that the face of this skull partook of the Tschudic, or even approximated the Mongolian form.

It is, perhaps, impossible to say positively whether this skull is a very old or quite a modern one. A knowledge of the precise epoch to which it should be referred, would assist somewhat in the determination of its nationality. I have already said that from its appearance it can scarcely be regarded as an ancient skull. Yet the appearance and degree of density of bones are by no means reliable criteria of their age; for it is well known that bones of the same age exhibit great dissimilarity in these respects, according to the location in which they have been deposited, according as they have been buried in the ground, deposited in caverns, submerged in water, or freely exposed upon the surface of the earth to air and light. The quantity and quality of the mineral and saline matters contained in the water in which such bones may have been placed, the nature of the soil in which they may have been inhumed, and other circumstances, are known to exert, in the course of time, peculiar changes in both the animal and earthy matter. But the data by which to determine with certainty the time required to produce such changes are wanting. Equally recent bones deposited in the same cave at the same time often exhibit very different appearances after the lapse of many years. And yet the circumstances of location, and the absence or presence of animal matter, are the only, and, it must be confessed, very unreliable criteria by which to determine the age of bony remains. A piece of the Jerusalem skull pressed against the tongue adheres slightly. A small fragment was pulverized, treated with ether, washed and thoroughly dried by exposure to a gentle heat. One drachm of the bone thus treated was macerated in a mixture consisting of three parts water and two parts hydrochloric acid. In eleven hours it was thoroughly dissolved, the solution being accompanied at first with a moderately active liberation of carbonic acid gas. A few pellicles of a gelatinous matter that had collected upon the surface of the liquid were removed and carefully dried. They weighed 11 grains. Sulphuric acid was then added to the liquid drop by drop until there was no longer any precipitation of lime. The supernatant liquid was poured off, and the sulphate of lime effectually dried by exposure to the sun and afterwards to the heat of an oven. It weighed 48 grains. One grain of the original weight was thus lost in the process. From this rough analysis it will be seen that the bones composing the skull under consideration contain a less percentage of animal and a greater percentage of calcareous matter than is contained in decidedly recent bones. A piece of an ancient Burgundian skull, reported to be about 2000 years old, a fragment of the skull of an ancient Roman, found in a tomb on the road between Cumæ and the ruins of Baïe, and a fragment of the skull of a young aboriginal female taken from an ancient tomb at Ticul in Yucatan, were subjected to the same analytical process. They were found to consist almost wholly of earthy matter. The animal matter had almost entirely disappeared. These bones were dissolved in a much less time than the piece from the Jerusalem skull, and their solution gave rise to a very active formation and escape of gas.

Great interest attaches to this skull on account of the fact that it presents an excellent opportunity to test the differential value of certain craniographic characters,—those pertaining to the crown, occiput and temporal region. The true value of craniographic criteria has not yet been settled. The special investigations in this branch of natural science are as yet too limited, and many of them have been undertaken in so hasty and unphilosophical a spirit, and with such imperfect views of the method that rules in craniography, that the generalizations thus far effected are not only few in number and of limited application, but must be used in the most careful and discriminating manner. It is well known to the members of the Academy that a skull in the collection marked Phœnician* was sent by M. Fresnel, the celebrated archæologist, to the late Dr. Morton, without the slightest information as to where, or the circumstances under which, it was found. After a careful study of its race characters, Dr. M. pronounced it to be a Phœnician. He afterwards learned from Fresnel that it was found in the sepulchral cave of Ben-Djemma, in the Island of Malta, and probably belonged to an individual of that race, which, in the most remote times, had occupied the northern coast of Africa and the adjacent isles.† It will thus appear that Dr. M., guided by osteologic characters alone, was enabled to announce the correct geographical locality of this skull, and perhaps also its true ethnic value; though of this latter point I entertain, at present, some doubts, arising from the remarkable resemblance which this skull bears to that of a wandering Chingán of Transylvania, depicted in Blumenbach's *Decades* (Tab. xi.) In like manner, some time before his death, Dr. Prichard sent to Prof. Retzius two human crania, requesting an opinion as to the race to which they belonged. He pronounced one of them to be Roman and the other Celtic, and was informed by Prichard that he was in all probability correct, for the two skulls had been dug up in an old battlefield at York, England, where the ancient British Celts, the Belgæ Brittanorum, had been vanquished by the Romans.‡ Another instance, similar to these, will presently be referred to. With such examples before me, I have been led to attempt, as far as the materials at my command would allow, to identify ethnically the skull from Jerusalem. It will be borne in mind that Drs. Prichard, Morton and Retzius had entire skulls submitted to them. The skull from Jerusalem, on the contrary, is, as we have just seen, in a very fragmentary state. It may be said that the knowledge of the locality in which this skull was found would assist materially in this investigation. But that this is not the case will at once be seen when we call to mind that this locality has been, for centuries, a great rendezvous for many races of men, coming from various parts of Europe, Asia and Africa. Moreover the skull is unique, not only in its form, (of which there is not an exact counterpart in the whole Mortonian collection,) but also in the fact that none others were found with it. Desirous of ascertaining whether any other skulls, similar in form to the one under consideration, had been discovered in Palestine, I examined a number of works of travel. At length, in the second volume of such a work published at Dublin in 1840, and entitled "Narrative of a voyage to Madeira, Teneriffe, and along the shores of the Mediterranean, by W. R. Wilde, M. R. I. A., &c.," I found a curious account of the discovery of some human skulls in one of the ancient tombs near Jerusalem.§

During his sojourn in Jerusalem Dr. Wilde learned that within the ground denominated *Aceldama*, or *Field of Blood*, (situated to the south of Mt. Sion,

*See Catalogue of Human Crania, p. 28.

†See Patterson's Memoir of Morton in 'Types of Mankind, p. xl.

‡Blick auf den gegenwärtigen Standpunkt der Ethnologie in Bezug auf die Gestalt des Knöchernen Schädelgerüsts. Von Prof. A. Retzius, Berlin, 1857, p. 6.

§A short notice of these crania is also contained in the *Edinburgh Phrenological Journal*, vol. 14, p. 217.

in the Valley of Hinnom, and close to the Mount of Offence,) and in the neighborhood of the painted chambers and the excavation called the tomb of Isaiah, some Arabs had accidentally discovered the doorway of a tomb carved out of the solid rock and concealed by a heap of rubbish, over which the soil had accumulated so as completely to hide the entrance. The doorway represented a Doric pediment, supported by rude pilasters, with some remains of floral embellishments, characteristic of Hebrew sculpture, carved upon the architrave. The interior of the tomb consisted of an oblong hall, cut with great precision out of the rock, and having at the inner end and on each side, a number of doors leading into small, oblong chambers or crypts, about seven feet long. On each side of these crypts was a trough or sarcophagus, hewn out of the solid rock, and filled with confused heaps of human bones in an astonishing state of preservation. Each set of crypts contained the skulls of distinct races of mankind. Dr. Wilde secured four of these crania, carried them to Europe, and through Dr. Graves of Dublin, sent casts of them to Dr. Prichard for examination. All the crypts on the right hand side of the tomb¹ contained dense, heavy crania of a long, narrow form, with a flat, receding forehead, very well marked superciliary ridges, and a prognathous superior maxilla. They evidently belonged to the African type. The skulls in the left hand crypts were of a shape the very reverse, as shown in plate 2, fig. 4 of Dr. Wilde's lithographic illustrations. "Although this skull," says the Dr., "differs in some respects from the true Mongolian, yet under that variety it must be classed. Its most striking character is its very remarkable narrowness in its longitudinal diameter, not only in contradistinction to the Ethiopian, which is characterised by extensive length, but in comparison with all other known crania. *It has an uncommon breadth and flatness of the occipital or posterior region;* and the very remarkable protuberance at the top of the head gives this skull a place among those termed pyramidal." Dr. Prichard regarded this skull as of Turkish origin, approaching the true Mongolian type more closely than any other. Dr. Wilde considers it probable that the skull appertained to some of the Turcoman tribes which still wander in hordes over the countries anciently named Parthia, Mesopotamia, Cappadocia and Pamphylia.

From the above description it will be seen that this skull resembles the fragmentary cranium from Jerusalem. The two appear to belong to closely related types or forms, as may be demonstrated by comparing the fragment under consideration with the drawing given by Dr. Wilde. The form shown in the latter is not the true Turkish as Dr. Prichard supposed. Had he compared Dr. Wilde's specimen, as I have Mr. Barclay's, with the skull of a Turk figured by Blumenbach, (Table 2,) he would have seen that though alike in the shortness of the longitudinal diameter, they are too dissimilar in the configuration of the occiput to be regarded as specimens of the same cranial type. It must be borne in mind, however, that Dr. Prichard frequently used the term "Turkish" as synonymous with Mongolian. Into this too comprehensive use of the term he appears to have been betrayed, in consequence of having adopted the questionable opinion of Remusat, Klaproth and Ritter, that the Turks are not a distinct people, *ab origine*, but descendants of the Hiong-Nu, who, anterior to the Christian era, threatened to overrun and subjugate China with their mighty hordes.* Domalius D'Halley† and Latham‡ assign to the Turks a Scythic origin. The latter expressly says that he considers the Mongoliform physiognomy to be the rule with the Turk and not the exception, and that the Turk of Turkey exhibits the exceptional character of his family. I can find no good reason for thus confounding the Mongolians proper with the

* Nat Hist. of Man, p. 290.

† Des Races Humaines, Paris, 1845, p. 84.

‡ Varieties of Man, pp. 78-9.

Turks. Judging from the figure in Blumenbach's *Decades*, above alluded to, the Turks are craniographically distinct from the Tartars and the Kalmucks, and should be regarded, as I have elsewhere maintained,* as an originally peculiar race, standing mid-way between the European and the Mongol, with which they are transitionally connected by sub-types, which have resulted from a double amalgamation on the part of the Turk, whose genealogical impurity we know to be very great. In the absence of Turkish crania in the collection, I am not able to speak positively upon this subject. In the Museum of the Army Medical Department, Fort Pitt, Chatham, England, there are two skulls obtained from the Turkish burial ground at Scutari. These are described by Dr. Williamson, in the following words: "No. 18. Cranium large, round, and very capacious; forehead high; vertex high, and very well arched; occiput rounded; space for the downward development of the cerebellum considerable; nasal bones well arched. No. 19. Cranium very large and capacious, and exceedingly well arched; forehead high and broad; vertex high, and occiput well rounded; facial bones well placed; the alveolar processes perpendicular, and the facial angle very high; lachrymal canal large."† The Turkish cranium is nearly globular, and though the external, occipital protuberance is but little developed, yet the occiput as a whole is rounded, and not vertically flattened as in Dr. Wilde's specimen, and the fragment found by Mr. Barclay. The latter is therefore not Turkish. Neither is it Jewish, for the Semitic skull, judging from the specimens in the collection of the Academy, is a long oval in form. Thus No. 842, the skull of a Theban Hebrew, ætat. 40 years,‡ belongs to the dolicho-kephalic class of Retzius. The crown is oval in shape, and the occiput regularly rounded. Nos. 818, 845, 865 and 870 exhibit the same general form, as may be seen by referring to the lithographic representations of these skulls in the *Crania Ægyptiaca* of Morton.§ No. 807|| is an oblong and somewhat angular head, with a perceptible flatness of the basal portion of the occiput, which renders the occipital protuberance apparently more prominent than in the other skulls of this group. No. 879,¶ though preserving the oval configuration, is not so long a head as the others. In the 28th and 34th Tables of the *Decades Craniorum*, Blumenbach figures two Jewish skulls,—one of a young person and the other of a centenarian. Unfortunately they are represented neither in profile nor in posterior view, and it is impossible, therefore, to determine satisfactorily the shape of the occipital region, or even the general form of the skull. In describing the physical characters of the Semitic Atlantide, (Arabians, Jews and Kaldani or Syrians of Kurdistan,) Latham says that these people possess "dolichokephalic capacious crania, with straight or prominent nasal and orthognathic maxillary profiles."*** In another place he says that the cranium of the Jew differs from that of the Arab in its greater capacity.†† Dr. Williamson describes a "Skull from the Jews' burial ground, on the road to Kollalie," in the following terms: "Forehead low and receding; posterior part of the cranium large compared to the anterior; superciliary ridge high and

* *Cranial Characteristics of the Races of Men*, in *Indigenous Races of the Earth*, Philada., 1857, pp. 273-4.

† *Observations on the Human Crania* contained in the Museum of the Army Medical Department, Fort Pitt, Chatham. By George Williamson, M. D. Dublin, 1857, p. 80.

‡ Figured in *Crania Ægyptiaca*, Plate 11, fig. 2. This drawing very accurately represents the skull in question. The reduced wood-cut in the *Catalogue of Human Crania in the Collection of the Academy*, (p. 34) is an inexact copy of this drawing. The outline of the posterior part of the head is drawn inaccurately.

§ Plate 5, fig. 4; pl. 12. figs. 1, 2; pl. 6, fig. 2; pl. 6, fig. 8.

|| Pl. 2, fig. 8.

¶ Pl. 8, fig. 2.

*** *Nat. Hist. of the Varieties of Man*, London, 1850, p. 511.

†† *Ibid*, p. 514.

very prominent; nasal bones arched with a depression at their root.* Hamilton Smith on the other hand speaks of the "beautiful spherical cranium of the Jews, as fine as the Arabian or Circassian;"† and in a recent work on the *Condition of Women and Children among the Celtic, Gothic and other nations*, it is asserted that the "Jews have, generally speaking, crania like the Saxons and Goths—short and broad," p. (69). This statement is certainly erroneous. The Jewish crania in the Academy's collection are, as we have just seen, long and ovoidal, with a comparatively receding forehead, and as Morton long ago observed, a strong and often harsh development of the whole facial structure. In his interesting work, entitled *Discoveries in the Ruins of Nineveh and Babylon*, Layard figures a bas-relief disinterred from Sennacherib's palace at Kouyunjik, and representing certain Jewish captives from Lachish. "These captives," he says, "were undoubtedly Jews, their physiognomy was strikingly indicated in the sculptures." A glance at these figures is sufficient to show that they belong, not to the short, but the long-headed races of men. The Jews are justly classed, therefore, by Retzius among the Asiatic Dolichocephalæ.‡

The Arab skulls in the collection, with the exception of No. 780, are entirely different from the fragment under consideration. No. 1296 is an oval, dolicho-kephalic head. No. 781 is an oblong head with the occipital region flattened superiorly, as in the Norwegian and Swedish§ skulls, and the occipital protuberance quite prominent. No. 784 is a long head approximating the oval form. Behind the mastoid processes it is quite broad, and the occipital region is full and rounded. No. 780 is a shorter head than the other. The crown exhibits the triangular form of that of the fragment from Jerusalem, but the triangle is longer. The occiput though flattened is not so decidedly flat as in the fragment.

This fragment differs also entirely from the Fellah skulls in the collection, not only in length but also in the configuration of the crown and the occiput.

Upon comparing it with the series of Egyptian skulls, I find that we cannot ascribe to it an Egyptian origin. It is a curious fact, however, and one worthy of mention in this connection, that among the figures in *Crania Ægyptica*, selected from Rosellini's great work by Dr. Morton to illustrate the Egyptian type of head, there are several which I am strongly inclined to think are not at all Egyptian. Two of these (Fig. 4, p. 34, and Fig. 3, p. 35) are evidently brachykephalic heads. In both, the hind head is vertically flattened. The former resembles the square or round-headed German, the latter calls to mind the Peruvian form. The first outline is that of the Harper in Bruce's tomb at Thebes; the second is a cook, who in the tomb of Rameses the Fourth, at Thebes, is represented with many others in the active duties of his vocation.

Before proceeding further in the attempt to determine the race to which the Jerusalem skull belongs, it will be useful to enumerate the very different races of men that have at different times occupied Jerusalem and its vicinity.

From the Acts of the Apostles we learn that during the first century of the Christian era, there were assembled at Jerusalem, besides the Jews, Parthians, Medes, Elamites, Mesopotamians, Judeans, Cappadocians, natives of Pontus, Asia, Phrygia, Pamphylia, Egypt, Libya about Cyrene, Rome, Crete and Arabia. Long after this we know that crowds of pilgrims were attracted to Jerusalem "from the shores of the Atlantic Ocean, and the most distant countries of the East." Among these pilgrims, Jerome, cited by Gibbon,|| mentions the Britons and the Indians. Three centuries later, (A. D. 614,) the Holy

*Op. Cit. p. 80.

†Nat. Hist. of the Human Species. Amer. Edit. p. 377.

‡Opus. cit. sup. p. 9.

§ See Catalogue of Human Crania, pp. 19, 20. Also Cranial Characteristics of the Races of Men in Indigenous Races, pp. 290, 291.

|| Decline and Fall of the Roman Empire Chap. 23.

City fell into the hands of the Persian King Chosroes II. In 637 it was conquered by the Saracens, and again became a resort for pilgrims from various parts of the old world. Then it was under the sway of the house of Seljuk; the Turcomans under Ortok having hereditary command of the city and neighboring territory. At length Ortok was driven out by the Egyptians, who in their turn yielded the possession of the holy city to the Crusaders under Godfrey of Bouillon. From the time of Godfrey down to the fall of Acre and the cessation of the Crusades in 1291, a period of some 200 years, the City of the Great King and all Palestine became the sanguinary arena in which the natives of Great Britain, Frenchmen, Flemings, Belgians, Normans, Scandinavian cruisers from the Baltic, Bavarians, Bohemians, Carinthians, Piedmontese, Styrians, Genoese, South Italians, &c., on the one hand, contended with Mussulmen, Mamelukes and the Kharizmian horde from Mongolia on the other, for the possession of the Holy Sepulchre.

Two interesting questions here present themselves. Does this skull belong to any of the races of men, which in successive waves have swept over and occupied, for varying periods of time, the Holy City and surrounding country? Is it possible to indicate the race of which the peculiar form of skull before us is the cranial type? Following the method of exclusion, the only philosophical method available in researches of this kind, where the positive criteria or data for determining a diagnosis are wanting, I have already shown that we can safely affirm that the skull in question is neither Jewish, Arabian, Egyptian ancient or modern, nor Turkish. With equal safety we may say that it is not Roman in its origin or affiliation. For Blumenbach figures the skull of a Roman prætorian soldier (Tab. 32) given to him by the Cardinal Borgia. The configuration of this skull differs from that of the Jerusalem fragment. "Protuberantia occipitalis externa latissima et ingenter eminens" are the words employed by Blumenbach in describing the hind-head of the former. Both Sandifort* and Martin† speak of the broad forehead of the Roman skull, and Retzius,‡ in describing such a skull found in an ancient cemetery at York, also alludes to the "broad and well arched forehead, and the broad, rounded occiput and prominent occipital protuberance," features not found in the Jerusalem fragment. Finally Dr. Thurnam,§ in his description of the skull of Theodorianus, found in a Roman sarcophagus at York, (the ancient Eburacum,) tells us that "the forehead, though low, is remarkable for breadth; that the coronal surface presents an oval outline, and is notable for its great transverse diameter; and that the occipital bone is full and prominent, especially in its upper half." None of these characters are exhibited by the fragment before us.

Is this fragment a Persian head? In the Persian skull figured in Tab. 35 of Blumenbach's *Decades* the occiput is truncated or perpendicularly flattened. In this respect it resembles the Jerusalem fragment. But when we turn to the Persian heads in the Academy's collection we find that they present a rounded occiput. Here then a difficulty occurs at once, as to the normal occipital form of the Persian head. Is there one form which is constant and typical or not? From a general survey of the configuration of the occiput in the various races of men, I am constrained to answer this question in the negative. Only by means of a very large number of native Persian crania can we determine this point. The flatness of the occiput in Blumenbach's Persian skull may or may not be an accidental and unusual feature. Whether it is or not there are differences between the two skulls now under consideration sufficient to assign them to different races. In the Jerusalem skull the whole hind-head is so flattened that it extends but a short distance behind the

* Tab Cran. diversar. Nationum, p. 1.

† Man and Monkeys, p. 223.

‡ Kraniologisches in Müller's Archiv für Anat., Phys., &c. Jahr, 1849, p. 576.

§ Crania Britannica. Decade I, p. 3.

meatus. In the cranium figured by Blumenbach only the extreme portion of the occipital region is flattened, and there is much more of the head projecting back of the bony meatus. We may conclude, therefore, that the fragment does not belong to the Persic type.

Of the cranial characteristics of some of the races mentioned in the 2d chapter of the Acts of the Apostles, I have not been able to find any record whatever. The materials, therefore, for determining positively, by the method of exclusion, the race to which our Jerusalem fragment belongs do not exist. The various races of men occupying from the earliest times the ancient Ionia or Asia Minor and the table lands of Persia and Armenia, constituted a very heterogeneous population, in which Cushite, Shemitic, Arian and Turanian ethnic elements appear to be inextricably blended. Much uncertainty prevails among ethnographers as to the distinctive physical characters of these different races. The national types of the Medes and Parthians are not certainly known. These people are generally ranked among the Turanians, Scythians, or Turk-Tartars; while the Persians, by nearly all chronologists and philologists are looked upon as true Japetidae. Mesopotamia appears to have been occupied from the remotest epoch by both Shemitic and Arian races. Renan, guided by philological data, considers the bulk of the population to be Shemitic.* To the Elamites Polybius and Strabo ascribe a northern origin. Josephus considers them to be the "ancestors of the Persians." Certainly in the first Maccabees, Persia and Persepolis are both called Elam. Lenormant, Quatremere, Movers and others consider the Elamites to be a people cognate if not identical with the Persians. On the other hand Löwenstern† thinks that the primitive Elamites were of Shemitic origin, and that in more recent times their ethnic characters were altered by intermixture with Scythic conquerors. It matters not which of these two theories we adopt. For as the Barclay skull differs from both Persian and Shemitic crania, it follows that in all probability it differs equally from the Elamitic skull.

The natives of Pontus were the Tibareni and affiliated tribes on the south-east of the Black Sea in the neighborhood of Colchis. The Tibarenians of Herodotus, according to Dubois,‡ are the Georgians of the present day. If so, the Jerusalem skull never belonged to a "native of Pontus."

If the Guanche skull in the collection represents truly the form of the Libyan or Berber head, the Jerusalem cranium cannot be considered as a specimen of that race;—for the skull of the Guanche is a long oval, terminated posteriorly by a protuberant occiput. In the Museum of the "Carolinischen Institut" at Stockholm, there are four Guanche skulls, which Prof. Retzius speaks of as "grosse, geräumige, ovale Schädel, sehr denen der Araber gleichend." In the anatomical Museum "de l'École de Médecine de Paris" there is a skull of a Kabyle woman. From the reference made to it by Dr. Gosse it appears to be a long, narrow skull.§ According to Furnari, however, the Berber cranium is "globuleux et conique en arriere."||

According to Klaproth the Parthians were cognate with the Getæ, Massagetæ, and other tribes generally included by the ancient writers under the vague and comprehensive term Scythian.¶ Strabo calls them Carduchi, i. e. inhabitants of Curdistan. Pulszky says, "The Parthians were probably not Persians proper, but an unartificial Turanian tribe, held in subjection by the earlier Persians under their Achæmenian kings, which, in its turn, revolting

* Histoire Générale et Système Comparé des Langues Sémitiques. 1 ère Partie. Paris, 1855, Liv. I. Chap. II. § II.

† Revue Archeologique, 1850, pp. 677-723.

‡ Voyage autour du Caucase, Paris, 1840, IV. 321, 328.

§ Essai sur les Deformations Artificielles du Crâne. Paris, 1856, p. 59.

|| Voyage médical dans l'Amérique Septentrionale. Paris, 1815, t. 1, p. 23

¶ Tab. Hist. de l'Asie. p. 40.

from the yoke, ruled the Persians above four centuries.'* Judging from the portraits of the 1st, 5th, 12th and 19th Arsaces, on their silver coins in the British Museum, the form of the Parthian skull must have been round or globular.†

Herodotus and Eudoxus, among the ancients, and Renan,‡ Gosche,§ Knobel|| and others, among the moderns, consider the Phrygians to be closely affiliated to the Armenians. This opinion is based upon purely linguistic considerations. There are reasons, however, for thinking that these two people were not cranio-graphically alike. Both Potocki and Dubois regarded the Phrygians as of Germanic origin. Hamilton Smith also speaks of them as a Getic clan. Among the five characteristic types of man exhibited in the bas-reliefs on the tomb of King Darius Hystaspes, excavated in the mountain Rachmend near Persepolis, there is a Lydian wearing a Phrygian cap, and "representing the mixed population of Asia Minor—a modification of the Arian type by the infusion of foreign blood—Iranian, Scythian and Shemitish interminglings."¶ The head is short and rounded. This is true also of a head of a Lycaonian warrior from a monument of Iconium, in the south-western part of ancient Phrygia. Renan, Movers and Knobel seem inclined to think that the ancient inhabitants of Pamphylia were of Phœnician origin. But the Phœnician, like the Shemitic skull, is dolicho-kephalic. Hence if the opinion of these gentlemen be well grounded, the short-headed Jerusalem fragment is not Pamphylian.

From these statements it will be seen that the Parthians, Phrygians, and perhaps also the Cappadocians and Cretans belong, in common with the Sclavonians, Finns, Turks, Kalmucks, &c., to the same short-headed group of crania to which must be assigned our Jerusalem skull. Of the exact form of their heads, however, I can obtain no satisfactory information. The affiliations of the Jerusalem skull must be sought in this direction. But the attempt to determine its exact place in the ethnographic scale is still further complicated by the question of deformation. Is it a deformed skull? It is not easy to answer this question positively. Deformed or distorted skulls are referrible, as regards the cause of distortion, to three classes, viz: 1st. Skulls artificially deformed by bandages, &c.; 2d. Skulls posthumously distorted in consequence of interstitial changes produced by the combined influence of pressure and moisture; and 3d. Skulls naturally or congenitally deformed in consequence of obliteration by synostosis of some one of the sutures, this obliteration taking place during intra-uterine or early extra-uterine life and by presenting a point of resistance, causing the brain and with it the calvarial bones to be unduly developed in certain directions, as has been very clearly shown by Dr. Humphry Minchin, of Dublin.** Now a careful inspection of the Jerusalem skull shows that no synostosis either of the lambdoidal or the posterior part of the sagittal suture can be pointed out. The occipital and parietal bones have been developed in the usual manner and from ossific points of ordinary number and location. The sutures mentioned though nearly consolidated have not been obliterated. The deformation is, therefore, not congenital. It is not posthumous, for if it were, the sutures would in all probability gap, and not admit of coaptation, and the head would be asymmetrical. We may conclude then that the head has been artificially deformed, by pressure strongly, evenly

* *Indigenous Races of the Earth*, "Iconographic Researches on Human Races and their Art," p. 151.

† *Ibid*, pp. 170-171.

‡ *Op. Cit.*, p. 44.

§ *De Ariana linguæ gentisque armeniæ indole*. Berlin, 1847.

|| *Die Völkertafel der Genesis*, p. 98.

¶ *Iconographic Researches*, p. 151.

** *Contributions to Craniology*. Dublin, 1856.

and continuously applied to the occipital region during growth. Formerly the custom of distorting the head was supposed to be confined to the American aborigines. It is now known to have prevailed in various parts of the old world as well as in the new. The Jerusalem skull is a strongly marked, perhaps I may say, an exaggerated example of the *Tête déprimée par derrière*, of Dr. Gosse, of Geneva. This excellent craniographer divides all artificially deformed skulls into sixteen classes. In the fifteenth he places occipitally flattened crania. Besides the Peruvian and other aboriginal Americans, the Tahitians, according to Ellis,* and the natives of the Nicobar Isles, according to Nicolas Fontana,† were in the habit of flattening the heads of their children in this manner. Insfeld, cited by Sømmering,‡ says of the Kalmucks, “quadratum formam appetunt.” We learn from Vesalius that occipital deformation was practiced in his time by certain German tribes. “Germani,” he writes, “vero compresso plerumque occipite et lato capite spectantur, quod pueri in cunis dorso semper incumbant, ac manibus fere citra fasciarum usum, cunarum lateribus utrinque alliguntur.” Hence, the term *tête carrée* applied to the Germans. Vesalius also writes of the Turks: “Turcarum capite globi fere imaginem exprimunt, ad hanc quoque obstetricibus nonnunquam magna matrum sollicitudine opem ferentibus.” The Tahitian and Nicobarian crania being dolichokephalic, we may, on this account, as well as for obvious geographical reasons, set them aside, as we have already the Turks, in our attempts to determine the nationality of the Jerusalem skull. We thus limit ourselves to a choice between the Mongols, Germans, Peruvians, and, for reasons presently to be stated, the Slavonians, and a certain brachykephalic race, cranial specimens of which have been found in the Catacombs of Paris, by the late Dr. Harlan, and placed in the Academy’s collection by his son. One of the latter, No. 664, bears much resemblance to the Barclay skull. The two, however, are by no means, identical in form. For the forehead in No. 664 is broader in proportion to the hind-head than in the Jerusalem skull; the crown in the former is consequently less triangular, and the occiput, though flattened in the same way, is not so decidedly and broadly flattened. The crown of our Jerusalem fragment more closely resembles that of a Slavonian head from Olmutz, No. 1251 of the collection. The calvaria in both is triangular in shape, but more elevated at the junction of the sagittal and coronal sutures in the Slavonian than in the skull from Palestine. The occipital region in the latter is globular, and has not been subjected to the flattening process. Nevertheless, if it had been vertically flattened by art, we can well imagine that it would have strikingly resembled the Jerusalem skull. The Slavic skull from Morlack, in Dalmatia, exhibits an oblong coronal region. The shape of the crown in the short-headed German type (such as seen in Nos. 37 and 1063) is a rounded square. In the German head, No. 706, the crown is triangular, but that part at the junction of the sagittal and coronal sutures, is very much arched, and in this respect is unlike the Jerusalem fragment. In the long-headed Germans the crown forms a broad oval. The Jerusalem skull very closely resembles the cast of a Burat Mongol head, No. 1355 of the collection. It also resembles the Kalmuck skull, No. 1553, though less decidedly. In the brachykephalic Burat head there is the same triangular crown, narrow at the forehead and broad between the parietal bosses; the same moderate fulness of the centre of the dome, and the same symmetry. Had the occiput been flattened the forms of the two crania would have been identical. As it is, the occipital region projects but a short distance behind the foramen magnum, so that very little compression would be necessary to

* Polynesian Researches, London, 1831, vol. 1, p. 80.

† Asiatic Researches, London, 1799, vol. 3, p. 151.

‡ De Corp. Human. Fab. Traject ad Mœnum, 1794, 1, 62.

give to it the occipital form of the skull from Jerusalem. The absence of the truncated occiput in the only specimen of the Burat type in the collection need not deter us from referring the Barclay fragment to this type. I have already noticed the fact that the Kalmucks were in the habit of giving a square form to the head. This practice was confined to male children. Females were for the most part exempt from it, and consequently retained the form of head given to them by nature. It is curious to observe that the Burat cast has every appearance of being the cast of a female skull—of one, therefore, which has escaped compression. As if to confirm the reference here made of the Jerusalem skull to the Burat cranial type, I may say, that after the above lines had been written, I received a copy of Dr. Latham's "Descriptive Ethnology," published during the current year. In the first volume, when describing the Mongolian physiognomy, he alludes to my description of the only Kalmuck skull in the Academy's collection, and quoting Blumenbach's epithets, says that the cranial collection in the Berlin Museum, the largest he has seen, verifies these epithets. He says further, that "the base of some of the Burat crania, and the *truncation of the occiput, are in some cases inordinate.*" (p. 339.) I find additional confirmation of the ideas here advocated in a posteriorly flattened skull brought to the Academy, within a few days past, by Mr. J. H. Slack, who informs me that it belonged to the collection of Prof. Weinland, and was found upon the battle-field of Balaklava. Though labelled Cossack, it is undoubtedly of Mongolian origin. In many respects it is analogous to the Kalmuck skull No. 1553 of the collection, but unlike this latter it has the occiput flattened. The Cossacks, it will be remembered, are a mixed people, made up chiefly of Slavonians, Turks and Mongols, the latter ethnic element predominating.

The Jerusalem skull resembles Nos. 85, 87, 450, 688, 752, 1232, 1458, 1459, 1464, 1473, 1481, 1493, 1495, 1504, 1509, 230, 497, and others of the Peruvian group. The former is, however, not identical in conformation with the latter. Nearly all these Peruvian skulls are irregularly distorted, and in most of them the sinciput appears to have been compressed as well as the occiput. Although distorted by the same means, and in general outline very much alike, yet they differ to some extent from each other in the shape of the crown, and even in the extent and direction of the occipital flatness. Except in the fact that the Burat and Kalmuck skulls are not artificially flattened as the Barclay cranium has evidently been, these three resemble each other more closely than the latter does the Peruvian. Nevertheless, the short-headed and occipitally flattened Peruvian skulls and our Jerusalem fragment are referrible to the same type, or at least to types so closely related that it requires careful examination to discriminate between them. Are we justified on this account in regarding the cranium from Jerusalem as a Peruvian skull? I think not. To refer a skull to its formal type is not the same as referring it to its appropriate race, nation or tribe. Two skulls of the same type may belong to very different races. This fact is involved in a curious law of homiokephalic representation, which has been entirely overlooked by craniographers, and the neglect of which has in several instances, led to very curious mistakes. The ancient Avarian skull found at Grafenegg, in Austria, by Count Von Brauner, so closely resembled some of the elongated and cylindrically compressed Peruvian skulls, that Von Tschudi declared it to be of Peruvian origin, and supposed that it had been brought over from Peru to Austria with other collections. Prof. Retzius, with greater diagnostic skill, pointed out certain differential characters which were overlooked or regarded as of no importance by Von Tschudi, and pronounced the skull to be indigenous to Europe and to have belonged to the Avarians. This opinion, which at first gained no support, was afterwards proven to be correct by the discovery of similar skulls at Atgersdorf, near Vienna, in Austria, at the village of St. Romain in Savoy, and in the valley of the Doubs, not far from Mandeuse. Fitzinger, Troyon,

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Gosse and Duvernoy examined these crania and confirmed the opinion of Retzius. The first mentioned observer has shown that they resemble in every particular certain crania found in the Crimea and described by Rathke and Meyer.* To refer the Barclay fragment to the Peruvian race would be to repeat the mistake of Von Tschudi.

Thus, then, from the foregoing details we may conclude quite positively that the skull found by Mr. Barclay is neither that of a Jew, Arab, Egyptian, Fellah, Turk, Roman, Persian, Elamite, Tibarenian nor Libyan. Reasons have also been adduced opposing the ascription to it of a Peruvian origin.

It may have belonged to the Parthians, Phrygians, Mesopotamians, Capadocians or Cretans, in so far as these are representatives of the so-called Turanian type. The craniographic data necessary to determine this point satisfactorily are almost entirely wanting.

It is, in all probability, either a Mongolian or a Slavonian skull. In some respects it resembles both, in some respects it differs from both. Hence the difficulty of determining between the two,—a difficulty increased by the fact that these two cranial forms or types are themselves closely related, and possess features in common, and that the differential characters by which they are distinguished reside chiefly in the facial and basal bones, parts which are wanting in the Jerusalem fragment. The latter, however, as we have seen, resembles more closely the Burat cranial form than that of the Moravian variety of the Slavonic. It resembles the former more strikingly perhaps than any other head in the collection that has not been deformed. Still it may approximate just as closely the head of a Tschek, Wend, Slovack, Croat, Serbian, Pole or any other representative of the great Sarmatian stock. I cannot make the necessary comparisons to determine this point, for the Academy's collection contains no specimens of these transitional races. I say transitional, for through these Slavonian tribes the brachycephalæ of Europe graduate into the brachycephalæ of Asia. To be more precise, I may say, indeed, that an attentive consideration of the Burat skull-type leads me to the belief that the short-headed races of Eastern Europe graduate into the Kalmucks and Mongols proper of Asia through the Selaves and Burats of Lake Baikal. The latter people, judging from the cast in the Academy's collection, belong to a type somewhat higher in the human cranial scale than the Mongolian. According to Tchihatcheff, they manifest more aptitude for civilization than the pure Mongolian tribes.

The type of the Burat head being displayed in the fragment from Jerusalem, I refer the latter provisionally to the people and the region about Lake Baikal.

This opinion is announced not as a positive and indisputable conclusion, but as an approximation to the truth,—an approximation, moreover, whose scientific value is necessarily as incomplete as the facts upon which it is based are limited.

From the foregoing remarks it will be seen that neither occipital nor calvarial characters *per se*, are as valuable as is generally thought by craniographers in determining the race to which any particular skull belongs. In like manner basal, facial or lateral characters, taken singly, will not be sufficient to determine the type of a skull. This type is found neither in the base, nor in the dome, neither in the occiput nor the sinciput alone. To a great extent it resides in the sutures, and is determined partly by the number and location of the ossific centres, and the rapidity with which development proceeds from such foci, and partly by the extent and direction of this development. During

* See Proc. Acad. Nat. Sci. vii. 405; compare also Fitzinger's Essay "Ueber die Schädel der Avaren" Wien, 1853; and Retzius' "Blick auf den gegenwärtigen Standpunkt der Ethnologie," Berlin, 1857, pp. 42, 43.

the centuries that have elapsed, since man first appeared upon the surface of the earth, the ethnical peculiarities which appear to have originally characterised the laws of cranial development in the different races of men, have become so masked or modified by hybrid interminglings of varied degree and kind, that the great principle of the correlation of forms is scarcely available in inferring from one or more fragments of a skull the typical form of that skull. Cuvier, the discoverer of this important principle of palæontology, regarded every organized being as a whole, whose different parts correspond to each other in such a manner that none can change without the others changing also. Consequently, to him not only each part, but each fragment of a part, appeared to be the index of all the others. He asserted that not only the class, but the order, the genus, and even the species are expressed in the form of each part, in the smallest apophysis, the smallest bony facet. Guided by this teleological principle, the sagacious Cuvier, from the examination of a single tooth, was enabled to announce the character of the entire skeleton of an extinct reptile. The jaw bone and teeth of an extinct species of animal then unknown (*Phascolotherium Bucklandii*) he correctly ascribed to a marsupial quadruped allied to the opossum. In like manner the fragment of a fossil femur, found in New Zealand, was referred by Prof. Owen to an extinct genus of tridactyle Struthious birds. The correctness of this reference was afterwards attested by the discovery of numerous remains of several species of this genus. So also, Prof. Leidy, following the same great law of the harmonization of forms, was enabled to assign the fragment of a fossil molar tooth, from Missouri Territory, to a species of rhinoceros. Subsequently, he received from the same place fragments of the maxillæ and cranium of this species sufficient to confirm positively his opinion. Still more recently he referred a fragment of the anterior portion of a fossil upper jaw, from the valley of the Niobrara river, to a species of camel, and this reference was confirmed by the discovery of an entire jaw of the animal bearing the peculiar hook-like process, which differentiates it from all other ruminants.

But, though the palæontologist and comparative anatomist can, from minute fragments of bone, reconstruct many of the extraordinary species of animals that flourished in earlier geological epochs, yet the student of human craniography can seldom, with any certainty, indicate from a fragment the type and race of a skull. The palæontologist is assisted to his conclusions by the law of co-existing elements or harmony of forms, and when this fails, as it does at times, and as it occasionally did even in the hands of its illustrious discoverer, he can resort to the comparison of the fossil remains he may be studying with the similar parts of animals now existing. The craniographer cannot avail himself of this law of correlation. The existence of numerous transitional forms, partly natural, partly hybrid, occupying places between the leading, typical stocks, and causing these latter to graduate into each other, in some instances almost insensibly; the difficulty of distinguishing between natural and hybrid sub-types; the existence of artificially deformed crania among different races in both hemispheres, some of them being purely arbitrary or conventional, and some of them imitations of natural but little known forms, all constitute serious obstacles to the practical application of this law to human crania. A still greater difficulty, moreover, is found in the fact that, in its practical working, this law is seen to be more generic than specific. In other words it differentiates genera better than species; species better than varieties. With the latter, though theoretically true, it is practically valueless. Cuvier himself was unable to point out specific osteological differences between the lion and tiger, the horse and ass, the dog and wolf, the leopard, panther, wild and domestic cats, &c. He was unable, consequently, to satisfy himself of the precise organic form or specific type to which the fossil representatives of these species belonged. Even, in regard to living species, Cuvier acknowledged that

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on veut la subdiviser en ordres d'après des caractères fixes et sensibles."* Nevertheless, it is well known that Agassiz, abandoning the Cuvierian method of comparing animals by their organs, and adopting Bichat's scheme of comparing the tissues of organs instead, was enabled to reconstruct the fishes of the fossil world by noting carefully the characteristics of their tegumentary membrane.

If it be true, indeed, for the animal world at large, as maintained by Knox, that specific characters are in the main external; and that the anatomy of the interior leads to higher considerations than the mere determination of species: and if it be true, that, on this account, the law of correlation so often fails in its application to species, still more should it fail when used as a means of diagnosing human crania from each other. For a serial unity of form is here more manifest than in the animal world proper, and this unity has become still more apparent under the combined influence of civilization and hybridity. In long periods of time civilization appears to be capable of modifying human cranial forms to a slight though appreciable extent. Hybridity, by introducing intermediate or transitional forms, gives to osteological characters, originally differential, an uncertain or fluctuating value. Naturalists are not agreed whether the carnivora of the fossil world were identical with the lions, tigers, panthers, leopards, &c., of the present time, or were specifically distinct from these. They are not yet decided whether all the species of the present fauna of this continent are distinct from those found fossil in the post-pliocene deposits of South Carolina or not. They find that the teeth and bones of the living rabbit, raccoon, opossum, deer, elk, hog, dog, sheep, ox and horse, cannot be distinguished anatomically from similar remains found in these deposits, and they are consequently at a loss whether to regard the former as the direct descendants of the latter, or entirely distinct from them; and this, too, notwithstanding that the fossil specimens are found associated with the remains of animals positively known to be extinct,—such as mastodon, megatherium, hipparion, &c.† They are not agreed whether the fossil horse resembled the quagga, the zebra, the dziguetai, the domestic horse, or an animal wholly and specifically distinct from all these. Agassiz "entertains doubts respecting the unity of origin of the domesticated horse."‡ According to Knox, the fossil horse belongs to no species of this animal now living.§ Prof. Owen finding that one of the teeth of a certain fossil horse is somewhat more curved than the corresponding tooth of the recent horse, declares the former to be a distinct species, and names it *Equus curvidens*. Prof. Leidy is persuaded that many remains of an extinct species of horse, from the post-pliocene of this country, are undistinguishable from the recent one. The specimens of teeth of this animal, which he has had the opportunity of exhibiting, present so much difference in condition of preservation or change in structure; so much variation in size, from that of the more ordinary horse to the largest English dray horse; and so much variability in constitution, from that of the recent horse to the most complex condition belonging to any extinct species described, that it would be about as easy, he thinks, to indicate a half dozen species as it would two.|| So it is with the varied cranial forms displayed in the great natural family—man. Of human crania, it is just as easy, indeed, I think it is easier—to make twenty-seven races, types, permanent varieties, or species—call them what you will—as it is to make any less number—so very mobile, so very elastic is the fundamental plan or structural type of the human skull. The uncertainty which surrounds the definition of the species of the genus *Equus*, exists also in connection with the

*Règne Animal, 1, ii p. 28.

†Sec Proceedings Acad. Nat. Sci., July 1859, p. 184.

‡See his letter addressed to Prof. Holmes, in Proc. Acad. Nat. Sci., July 1859, p. 186.

§Introduction to Inquiries into the Philosophy of Zoology, in London Lancet, for October, 1855, p. 275.

||Proc. Acad. Nat. Sci., July, 1859, p. 182.

genera *bos*, *ovis*, *capra*, *ursus*, *canis*, *felis*, *sus*, and other extant natural families, representative remains of which have been found in strata appertaining to geological epochs anterior to our own. Difference of species for *Ursus maritimus* and *Ursus Americanus* could not be predicated upon the skulls only of these animals. The crania of *Felis canadensis*, *F. concolor*, *F. chalybeata*, &c., in the Museum of the Academy, are identical in form and dentition with the skull of *F. tigris*. So, also, the skulls of *Canis lupus*, and *C. familiaris* are identical with each other. I doubt if there is the anatomist living who from the study of one or several bones of the head of one of the above mentioned species, could unerringly refer them to their proper species. Still less, if the animal were extinct, could they restore the species. To their appropriate genus these bones might be restored, and this genus might be reconstructed, but nothing more. So, also, supposing the Jew, the Gipsy, and the Eskimo, all long-headed people, were extinct, I feel very certain that no ethnologist could, from their crania alone, restore the distinctive, ethnic features of these people,—the prominent, unmistakable nose and mouth of the first, the long, dark and squinting eyes, and narrow radix nasi of the second, the stunted form and flat, lozenge-face of the last. On the other hand suppose the Finn, the Lapp, the Turk and the Slav, all long-headed people, were among the past and gone. Then the problem would be, if anything, still more difficult. For these crania resemble each other much more closely than do those of the Eskimo, Gipsy and Jew. If we were to contrast the skull of an Eskimo with that of a Slav or a Turk, or the skull of a Gipsy or Jew with that of a Finn or Lapp we should soon discover that there were greater differences between the crania thus compared, than between the different species of *Ursus*, or of *Canis*, or of *Felis*. The most striking difference is to be found in the length or antero-posterior dimensions of the two classes of skulls. Upon this feature, indeed, Retzius has founded his two groups of human crania—the dolichocephalic and brachycephalic. But this difference in length is accompanied by other characters, some of which though less striking to the ordinary observer, are not the less valuable and distinctive, in an ethnical point of view. If all skulls were either long or short the craniographer might readily refer any particular skull submitted to his inspection to one or other of these two classes. But there are many crania which are shorter than the so-called “long skulls,” and yet longer than the so-called “short skulls.” These constitute a class intermediate between the dolichocephalæ and brachycephalæ, into which they graduate on either hand so insensibly that they are separable from them by no trenchant lines. A skull having been placed among the dolichocephalæ, or it may be among the brachycephalæ, it is still as far from being minutely classified as the head of a dog which has been located in a group called simply “*Canis*.” It may be orthognathic or prognathic, it may be square-, oblong-, oval-, or lozenge-faced; it may have an oval, triangular or square crown. In many skulls these features may be, and, indeed, are, variously combined. Individual crania of the same group not unfrequently exhibit these features differently combined. On the other hand two skulls closely resembling each other may belong to distinct races differing in general appearance, in language, in habits, in intellectual and instinctive traits. Contrast, for example, the skull of a Græco-Egyptian, No. 837 of the collection, with that of an ancient Swede, No. 1249. These heads differ no more from each other, than they respectively do from the other specimens of the groups to which they severally belong. Upon our side of the Atlantic the Swedish crania find their representatives in the Arickaree Indian skulls.

The Academy's collection furnishes other examples of this seeming paradox; some of them exhibited by races which occupy widely separated localities, and of the assumed community of origin of which there is not only no scientific proof of a positive character, but even no presumptive testimony that is reliable. The recognition of such facts led me, more than two years ago, to

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express my conviction that strong resemblances between human, cranial types do not infallibly indicate a common parentage,—such resemblances merely manifesting similarity of position in the human series.* Human osteology, however, is not peculiar in this respect. Prof. Agassiz thinks that the circumstances under which were found the fossil remains obtained by Prof. Holmes from the post-pliocene or post-tertiary beds of South Carolina, “show beyond the possibility of a controversy,”—I am using his own strong language,—“that animals which cannot be distinguished from one another, may originate independently in different fauna.”† It will thus be seen that in many instances to refer a skull to its appropriate formal type is one thing; to refer it to its proper race, quite another. An obscure system of homoiokephalic representation seems to prevail among the races of men, in virtue of which the cranial type of one race repeats itself among another people, very distant from, and unknown to the first. Hence the law of cranial correlations is, to a certain extent, obscured, and its utility in identifying and classifying human skulls very much impaired. But the great difficulty after all with the craniographer is to fix upon characters which are at once definitive, differential and constant, and therefore typical beyond all doubt or cavil. The skulls of the orthognathic Greek, and the prognathic Saharan Negro differ more from each other than do those of the nandu and ostrich, those of the llama and camel, or those of the genera *Tarandus*, *Alces*, *Cervus*, *Panolia*, *Axis*, *Cariacus*, *Blastocerus*, *Capreolus* and *Cervulus* into which naturalists divide the Cervidæ. But the negro differs cranially as much from the Eskimo, the Phœnician and the Malay as from the Greek. Yet the Eskimo, the Phœnician and the Malay, like the woolly-haired typical African, are all prognathic. The prognathism of the one, however, differs in kind from that of each of the others. Here, then, are differences which, though minute, serve to alter the entire physiognomical expression of a skull, and so affect not only its classification but its identity also. When we compare together extreme crania, without reference to intervening forms, these differences are seen to be differences of kind. But as soon as we take into comparison the transitional cranial forms or types, which fill up the space or gap between these extremes, then these differences become differences of degree rather than of kind.

The same uncertainty characterises the species of many genera of birds, reptiles, shells, plants, &c. Dr. Adam Smith placed in a row all the known species of the natural family of the Alcaudæ, and in presence of such an ordeal, all the pretended specific external characters of naturalists completely broke down. Dr. Knox dissected the serpents of South Africa, and divided them, according to the dentition, into those with poison fangs, and those without. This he regarded as a scientific distinction. But when he began to dissect the serpents of the globe and not those of any particular region he quickly found that the distinction was invalid. That certain species of insects carry poisonous fangs only on the upper maxillary bones is true; but as there are many which carry also harmless teeth on the same bones, the fact becomes of little or no value scientifically or practically.‡ It is needless to multiply proof in this direction. Indeed it seems to be a general fact that just in proportion as the species of a genus become more and more numerous, their differential characters become more and more confused and uncertain, and the species when ranged side by side are seen to blend with or pass into each other in obedience to a great, fundamental law of graduation through which their true structural unity finds its only expression. Viewing the facts of specific differences in this comprehensive way, and bearing in mind that the question of

* Cranial Characteristics of the Races of Men, in *Indigenous Races of the Earth*, p. 349.

† See his letter to Prof. Holmes in *Proc. Acad. Nat. Sci.* loc. citat., p. 186.

‡ Contributions to the Philosophy of Zoology, with special references to the Natural History of Man. *London Lancet*, November, 1855, p. 386.

origin or parentage is not *necessarily* connected with that of cranial forms, it is evident that if we accept for man the recognised principles of zoological classification, we must regard the human family as a genus represented by numerous species, whose differential characters touch, so to speak, or even overlap each other. There is undoubtedly a serial unity of all human crania. There is, in other words, a human cranial type—the type of a natural class or family widely separated from the most anthropomorphous apes—a type susceptible of very numerous, but individually limited, modifications, the result of climatic conditions, and persisting as long as the conditions which bring them into existence continue; a type susceptible, also, of hybrid modifications, which though ephemeral and not self-sustaining as are the great stocks, are transitional and therefore valuable as showing all the possible variations of the primal or central form. All these variations tend constantly to assume the normal type, to assume it indirectly or spirally, as it were, so that the extreme departure from the type is bound to the latter through graduated forms, in such a manner that when the extremes of the series are compared together with reference to these forms, it is difficult to point out the constant and unvarying differential characters.

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DESCRIPTION
OF A
DEFORMED, FRAGMENTARY HUMAN SKULL,
FOUND IN
AN ANCIENT QUARRY-CAVE AT JERUSALEM;
WITH
AN ATTEMPT TO DETERMINE, BY ITS CONFIGURATION ALONE, THE
ETHNICAL TYPE TO WHICH IT BELONGS.
BY
J. AITKEN MEIGS, M. D. ✓

Professor of the Institutes of Medicine in the Medical Department of Pennsylvania College; Physician to the Department of Diseases of the Chest in the Howard Hospital and Infirmary for Incurables; Corresponding Secretary of the Philadelphia County Medical Society; Member of the Academy of Natural Sciences of Philadelphia; Fellow of the College of Physicians, etc. etc.

"Skulls, madam," said the Sexton.—"Some of them must have belonged to strange fellows. Only see that one! Spirit of Eld, what a skull."—LAVENGRO.

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